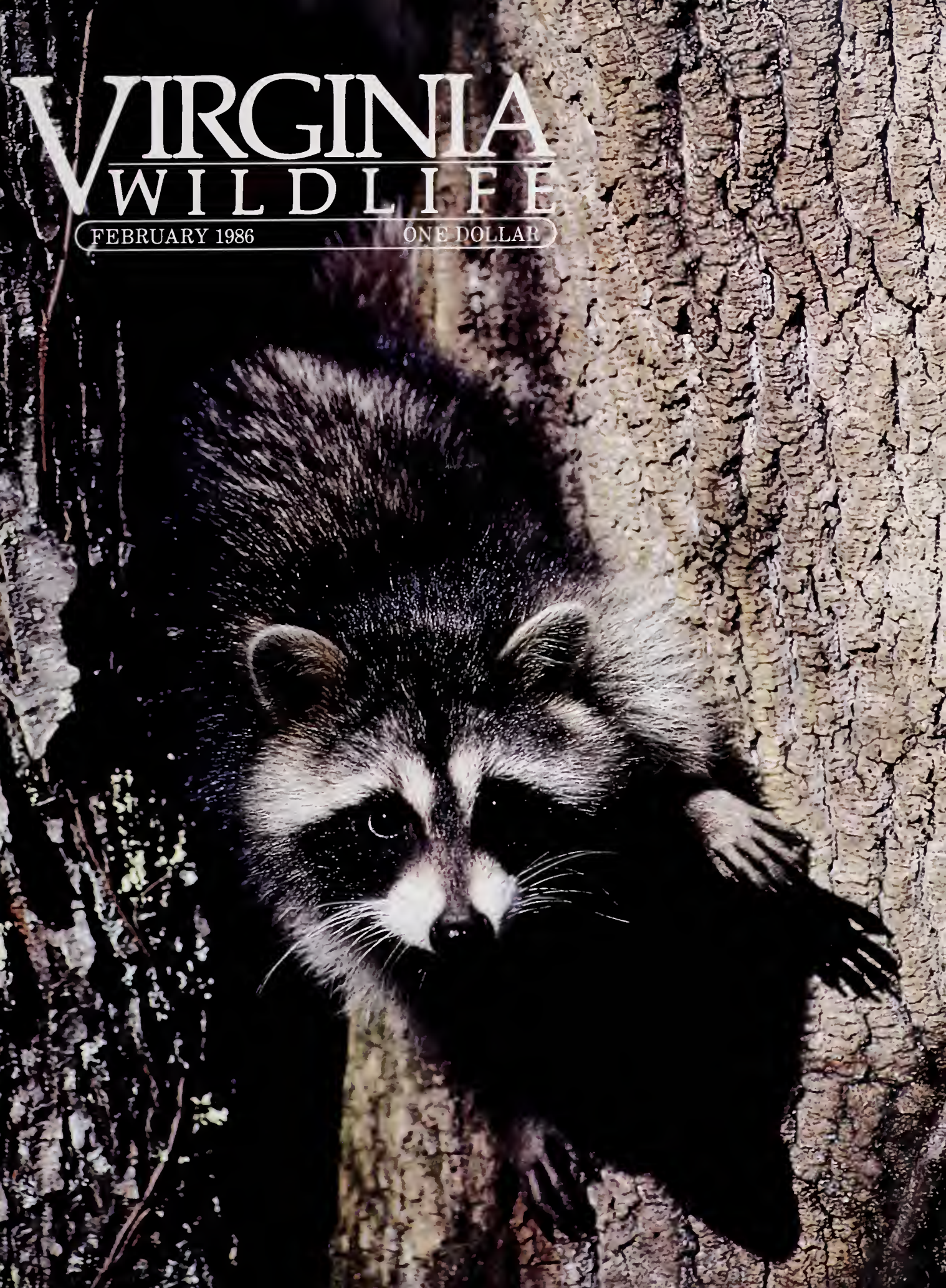
VIRGINIA WILDLIFE

FEBRUARY 1986 ONE DOLLAR



I've been thinking about going to this Sierra Club meeting tonight, but it's like contemplating a greenbrier thicket about 3 o'clock in the afternoon after a full day of hunting. Hopeless—the kind of thing that makes you want to head on home. But, just like it takes another frame of mind to get through greenbrier, it takes another frame of mind to get through a Sierra Club meeting. When you're looking at greenbrier, you look beyond it, thinking you might jump something right in the middle of it, or there might be some great big woods just on the other side. Same thing with a Sierra Club meeting. You walk in, and you're ready to duck out a side door once you see all those Patagonia jackets and bandanas. But, if you sit down, wait it out and listen, you calm down. You find out they're talking about things that you're concerned about, too—even if if does make you uncomfortable to be sitting next to someone who might not eat meat. The bottom line is that we ought to be there.

The meeting tonight is going to discuss the new Forest Service proposed management plans for the George Washington National Forest. They've even invited a wildlife planner from the USFS to speak. After he's done and the meeting's over, the members will draft their own letters concerning the Forest Service proposal; letters that will mean a whole lot to the powers that be.

Why aren't we there? Why aren't the sportsmen, who are just as interested in the management of the National Forest as the Sierra Club members are, attending that meeting? Because we're close-minded. And they're close-minded. We don't attend their meetings, and they don't attend ours. But the fact is, this kind of stuff is going to affect *us*. And we're letting the opportunity to influence decisions pass us right on by.

I know a sportsman who believes he pays his dues. He's a member of the National Wildlife Federation, Izaak Walton League, NRA and Ducks Unlimited. He figures that's enough. But, has he written any letters, attended any planning meetings, or tried to keep track of conservation issues in the state? Heck, no. On the other hand, those Sierra Club members *are* going to voice their opinions—loud and clear. I believe they will do their best to understand the issues, but they need all the help they can get—they need *our* help. I'm not sure how many of you have ever looked at an EIS or something as complex as the Forest Service management plan—but I'll tell you right now, even those with a degree in biology will find such documents nearly unreadable. That's why you need more people working on it. More people to question, to clarify difficult parts, because the final letters written *will* mean something.

The reason the Forest Service came up with this new proposal in the first place is because the public squawked about the original one. Now, I'm not sure how much *informed* squawking was done, but that is not the point. Squawking of any kind is heeded. If enough people feel that clear-cutting is bad, or additional roads into the backcountry are bad, the Forest Service is going to revise their proposals, regardless of the technical expertise of the squawkers. You see, the Forest Service, and any other government agency, is required to give the people what they want; and if the people talk, the Forest Service is going to listen.

Because of that, all of us who brag about our membership in Ducks Unlimited, the Turkey Federation, the Quail Hunters Association, and any other sportsmen's group, should storm the meetings of Sierra Club, the Audubon Society, and any other politically active conservation organization—because we care. Yeah, I know it's hard to go in there and have to face a few hard-core preservationists, but I've found it hard to face some red-neck meat hogs, too. Let's face it, we're all in it together. We may not see eye to eye, but in the final analysis we all feel the same way about the woods. We don't want to lose them, Yeah, I think I'll choke on my pride tonight. It'll be hard, especially since I don't know half as much as those guys do about the Forest Service proposals. But, I'd like to believe I won't be the only one there wearing camo.

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The

How to survive the winter? Many animals just snooze through it.

Some day this month the winter's first really frigid cold front will roll in, spitting gray snow and catching us without our heavy jackets. On that day I'll wish I were a groundhog, curled up comfortably underground, oblivious to it all. How nice it would be to sleep through the winter! No walks to shovel, no chapped lips, no demoralizing utility bills.

Actually, we humans have learned to cope with winter pretty well. For us, the cold weather is only an unpleasant annoyance. For wildlife, though, winter is more than that: It is the Big Freeze, The Long Starvation, the Great Eliminator.

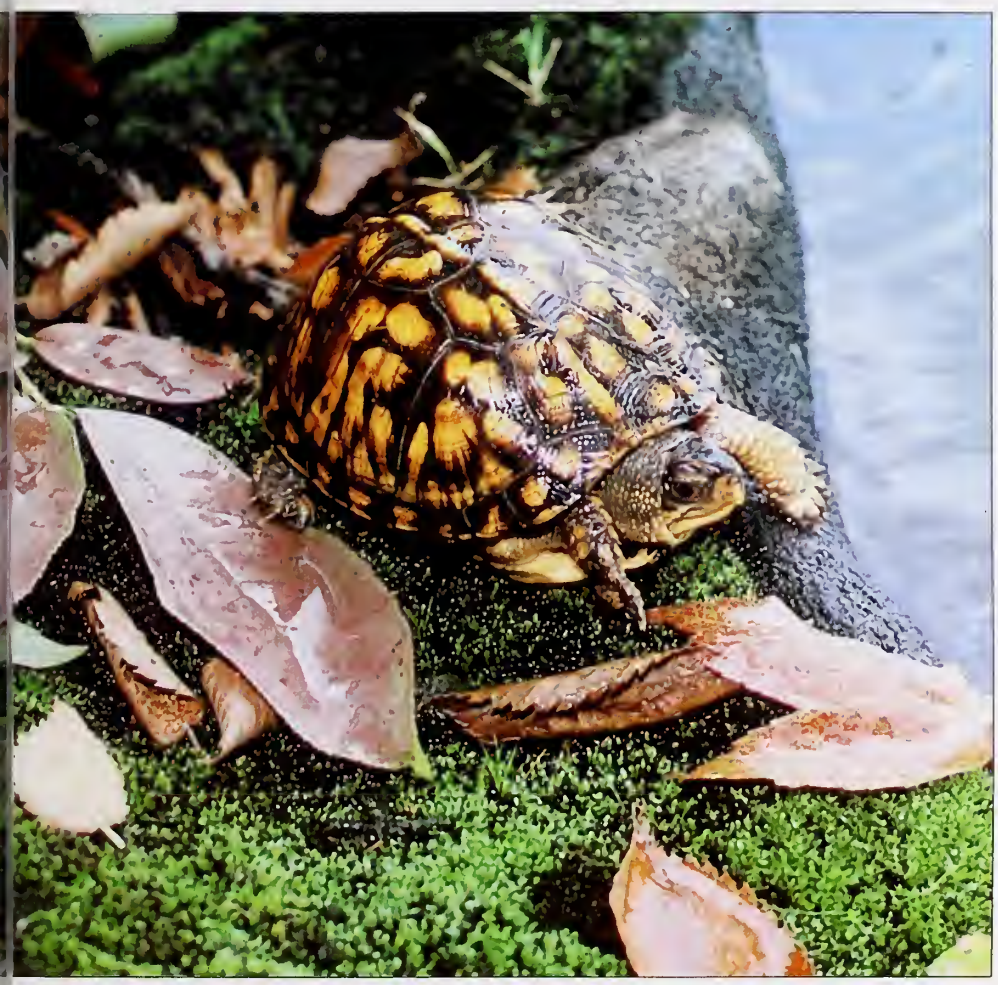
Though winter's hardships threaten all animals, the frigid weather affects cold-blooded creatures and warm blooded creatures in different ways. For the "cold-blooded" animals (those whose internal temperature is regulated by the temperature of their environment), winter's negative impact is simple: if they freeze, they die. In order to survive winter, cold-blooded animals must become dormant. Virginia's cold-blooded animals follow that necessity. Virginia's cold-blooded animals—insects and other invertebrates, fish, amphibians and reptiles—slow down as cold weather approaches (like 45 rpm records played at 33 1/3 rpm). However, freezing weather will slow them to a complete (and fatal) stop, so as autumn progresses they must seek shelter in places where the temperature will stay above 32°F throughout the winter. Fish, many frogs and turtles, and aquatic insects are safe in the water or muddy bottom sediments as long as their pond, lake or stream does not freeze solid. On land, there are other hiding places. Many pickerel frogs seek shelter in caves. Snakes den in rockslides, crevices and mammal burrows. Insects, spiders and other invertebrates overwinter under tree bark, in rotten logs, and deep in the litter of the forest floor.

Usually, cold-blooded creatures enter dormancy about the time of the first killing frost. Most are not seen again until after the last hard frost in the spring. Some, however, emerge briefly during warm spells. Many insects fit this pattern. Box turtles, too, may dig their way out of the soft earth where they have laid dormant, and wander about on sunny days. However, if a sudden freeze strikes, the turtles may be killed before they can return to the

Squirrels do not hibernate, instead they store food for the lean winter months; photo by G.K. Scott.
Box turtles may stir from their dormancy on warm winter days, only to be killed by a sudden freeze; photo by Gary Gaston.

Winter Sleepers

by David Catlin



protection of the forest soil. Many turtles die each winter from just such mistakes.

Though freezing is generally fatal to all cold-blooded creatures, recent research has shown that several kinds of frogs can actually survive it. In Virginia, the wood frog, the spring peeper, and the gray treefrog produce a chemical that allows them to withstand temperatures in the twenties—a great advantage, since all three species overwinter relatively close to the surface of the forest floor, where soil temperatures frequently get that cold.

For "warm-blooded" animals (those which produce their own heat), the threat of winter is not the cold itself, but the effects of the cold on the fields and forests. Frigid weather removes most of the plant life that supports the forest's food chain, and warm-blooded animals are left with furnaces to stoke—and no fuel.

While cold-blooded animals have no choice but to become dormant or perish, warm-blooded wildlife have a variety of options. Some fly south to feed in warmer climes. Some change their diets. Some just tough it out. And a surprising number survive the cold months like their cold-blooded neighbors, by simply snoozing through them. Unlike cold-blooded animals, mammals and birds as a rule cannot let their internal temperatures change with the seasons. Our own temperatures are so constant that our mothers begin fretting when they change more than a degree or two! As a result, warm-blooded animals have a problem to solve if they are to sleep through the winter: they must either find the food energy to keep their internal furnaces burning, or they must somehow "turn down the thermostat" and let their body temperatures drop.

Different animals use different strategies. The black bear is a good example of the "pile on the firewood" approach. Bears, as you've probably heard by now, are not true hibernators. Though they may doze for many days at a time through the bitterest part of the winter, their temperatures drop only a few degrees. A bear's heart continues to beat strongly, and it doesn't take much disturbance to rouse the animal. Many pounds of stored fat, added during an autumn acorn-eating binge, both insulate the bear and pro-

vide the calories to keep its temperature high.

The secret of good winter sleeping seems to be good autumn eating. For example, the skunk, another non-hibernating sleeper, may lose up to forty percent of its body weight during the winter. Young animals which haven't built up enough fat reserves risk death.

Like bears and skunks, raccoons and opossums also do a lot of cold-weather napping without entering a state of true hibernation. Warm spells in midwinter remind outdoorsmen of these light sleepers, for a walk in the woods at such times may reveal their tracks in the snow.

In addition to these cat-nappers, Virginia has a handful of mammals which are real Rip Van Winkles—the true hibernators. Hibernation, as biologists define it, is a deep sleep-like state with significantly lowered body temperature and metabolism. The hibernators have indeed turned their internal thermostats down, allowing their temperatures to drop almost to the freezing point. At the same time, pulse rates plummet, digestive tracts collapse, and glands shut down. Hibernation allows a warm-blooded animal to become, for a time, an essentially cold-blooded one. And the big benefit is that it takes a whole lot less energy to be cold-blooded.

Probably the best known hibernator in Virginia is the woodchuck, or groundhog. Now here's an animal who's serious about his sleep! In the late summer and fall, groundhogs begin to add fat. They increase their weight substantially, for even the low body temperatures of hibernation will drain energy reserves over many months. By late October, many of the older, fatter adults have entered their winter dens. The younger animals, hurrying to add a final few calories, generally remain active longer. By mid-November, though, virtually all groundhogs have disappeared underground.

Their den chambers are several feet below the surface, often under the roots of a tree or stump. Before retiring, the groundhog seals the passsage between its winter den and the main tunnel to discourage unwanted visitors. Then, it settles down to hibernate. The woodchuck's bodily functions slow down, and its temperature drops to near that of the cold earth around it. There the animal remains until spring's wake-up

(Above) Chipmunks hibernate for a few days at a time, waking up at intervals to feed on squirreled away food; photo by Steve Maslowski.
(Opposite) The woodchuck, or groundhog, is probably Virginia's best known hibernator—though they rarely emerge to see their shadows on February 2nd here in the Old Dominion; photo by Bill Ivy.
*The wood frog (*Rana sylvatica*) shown here produces a chemical that keeps it from freezing when temperatures get down to the twenties; photo by David Catlin.*

call back to "life."

Do groundhogs emerge in time to see (or not see) their shadows on Groundhog Day, February 2nd? Very rarely. In the southern part of the state, diligent searching might find you a groggy whistle-pig peeking out of his hole on that fateful morning. In northern Virginia, groundhogs aren't likely to emerge until the middle of the month. In other words, if you're looking for signs of spring, better stick to red-winged blackbirds and pussy willows.

Virginia's other true hibernators offer a few variations on the groundhog's theme while following the same basic behavior. Jumping mice add their fat reserves in just a short two-week period, before retiring to their grasssy underground nests. Chipmunks skip the autumn bingeing entirely, electing instead to store food like their cousins the squirrels. They then hibernate for only a few days at a time, arising periodically like Dagwood Bumstead to raid their larders for midnight snacks.

The bats which hibernate (some kinds fly south like birds) often pile together by the hundreds to hang from the ceilings of caves as they wait for spring. In fact, this behavior has helped put the Indiana bat (found in the western part of Virginia) on the federal endangered species list. Though thousands of these bats still exist, many of their hibernating caves have been lost to human disturbance, and the loss of just a few more of these winter roosts could bring the bats to the edge of extinction.

On the whole, though, winter dormancy has proven to be an effective survival strategy for many forms of wildlife. For the winter sleepers, winter's hardships are just a bad dream.

And, it may be that my hope of joining these sleepers in their winter naps may not be so far-fetched. Articles in several scientific journals recently announced that rhesus monkeys, injected with an extract from the blood of hibernating groundhogs, plunged into a deep sleep. Their temperatures dropped as much as 10°F, and their heart rates fell as much as 50%. One headline even speculated, "Human Hibernation at Hand?"

So dig out your kerchief, Ma, and bring my cap. We may avoid chapped lips and those depressing utility bills after all. □

Illustration by Cindie Brunner

The Preachings of an Old Hunter

Old hunters never die; they just pass all they know on down to their sons.

by Joel M. Vance

Yes, I read *The Old Man And The Boy* and I know how geezers are supposed to take a wet-nosed kid and make something of him.

Maybe half the classic sporting literature involves some old codger with a gawky kid in tow, out there showing him the mysteries of life, where the mushrooms grow and the grouse drum.

You get the feeling that every old man is issued a kid, ignorant, but not stupid, whom he can bore silly for hours on end. Did anyone ever stop to think there probably are many old woods rats who don't want to be bothered?

My Grandpa Vance was one of them. I was the runt of the grandkid litter, but he was just as indifferent to the strong pups as he was to me. He wasn't spiteful or mean—he just was powerfully disinterested in passing along his lore to a kid who looked as if the next strong wind would blow him away anyway.

Our country in the 1940s was tough duty for farm folk. They raised some tobacco, their own food and enough hay and grain for a few cows and pigs. It was subsistence farming on an 80 or a 160, and it was tough. No time for visiting city kids with allergies and no muscles. Once I brought fleas into the house and my aunt hided me good.

I used to try to pitch hay, and most of the time it fell off the fork and down my neck. Another time, my uncle's plowhorse threw me off a mile from the house and I found that a plowhorse can plod just one step faster than a crying, cussing kid can run.

My Grandpa looked the way wild Bill Hickok probably would have looked in 20 years had he not incautiously sat down in front of a bullet (Wild Bill, not my Grandpa) in a Deadwood, South Dakota saloon.

Grandpa had a drooping white mustache, and was so fiercely independent

that when he went bald, he glared at Mother Nature with an outraged eye and grew another head of hair. It was thin, but by golly, it was there.

I remember him as tall and lean, though to a little kid, everybody was tall. He was lean, for he was a hill man. Game was scarce in the 1940s and you had to walk a long way and make the bullets count. He did both.

He was a carpenter by trade, and his name was Joseph, though I'm sure there were no Biblical implications. He was a Christian, but instead of fishing for souls, he fished for catfish in the muddy river using hand-made fish traps that were as exquisitely crafted as they were illegal.

Maybe Grandpops of literature twinkle and beam at their piping grandsons, and generously include them on woodland rambles, but not my Grandpa. He'd worked about 65 years to insure his privacy and, by God, he was going to enjoy it. If there were the slightest indication that I was interested in tagging along, he would glower fiercely at me, like an old lion pestered by a bumptious cub, and I would swallow whatever timorous suggestion had been on my lips and resign myself to another afternoon of vicarious adventure with his hunting magazines.

Grandpa could be found in one of two places—either the extensive woods to the West or somewhere along the old river, tending his ever-producing traps. That was a two-mile hike each way and when I knew him, he was already well past 70, barreling toward his 80s with a steady, measured gimp.

No problem. I would see him methodically marching across the back pasture, finally vanishing over the far hillcrest.

No one ever seemed to worry much about the old man off by himself God-knows-where in the woods. No one fretted that he might hurt himself or become ill with no chance of help. I guess they either figured he was indestructible or that if he were to go, he'd want to be out there, not at home or, even worse, in a hospital connected to life by needles and tubes.

Along about sunset he'd come trooping home, carrying in one hand a Marlin bolt action rifle my Dad had given him, in the other a couple of squirrels. Maybe he sometimes came home empty handed, but I sure don't remember it.

That was the way it was more than 40 years ago. I can't say that he left me a direct legacy of hunting how-to or outdoor lore. He figured life was a game you learned by playing and he wasn't interested in being my coach.

On the other hand, why, if there were no bond between us, do I remember so clearly his fierce independence, his frosty-blue eyes, his steady, proud figure coming home from the hill?

No, the teaching was there all right. He taught by example, whether he intended to or not. And he let me prowl among his meager possessions—the Indian artifacts he'd picked up here and there, the collection of Indian-head pennies, his magazines and books. Once, I was off in some little make-believe world, probably talking to myself in the voices of three or four characters, when I happened to look up. He was peering at me over his bifocals, and there was no mistaking the smile under that bushy mustache.

Thinking back on it, he must have made me feel welcome in his sanctuary, or I wouldn't have been there. I never was uncomfortable in his house. It was home to me, as well as to Grandpa.

> "...When I pick up my gun and go to the big woods alone, I realize that maybe there is a constant in this world of shifting sands."

And then there came the day that the old oak of a man was felled by the lightning bolt of a stroke. For the first time his sanctuary was violated, by his own alien, stunned body, and by weeping relatives. I didn't want to go there anymore.

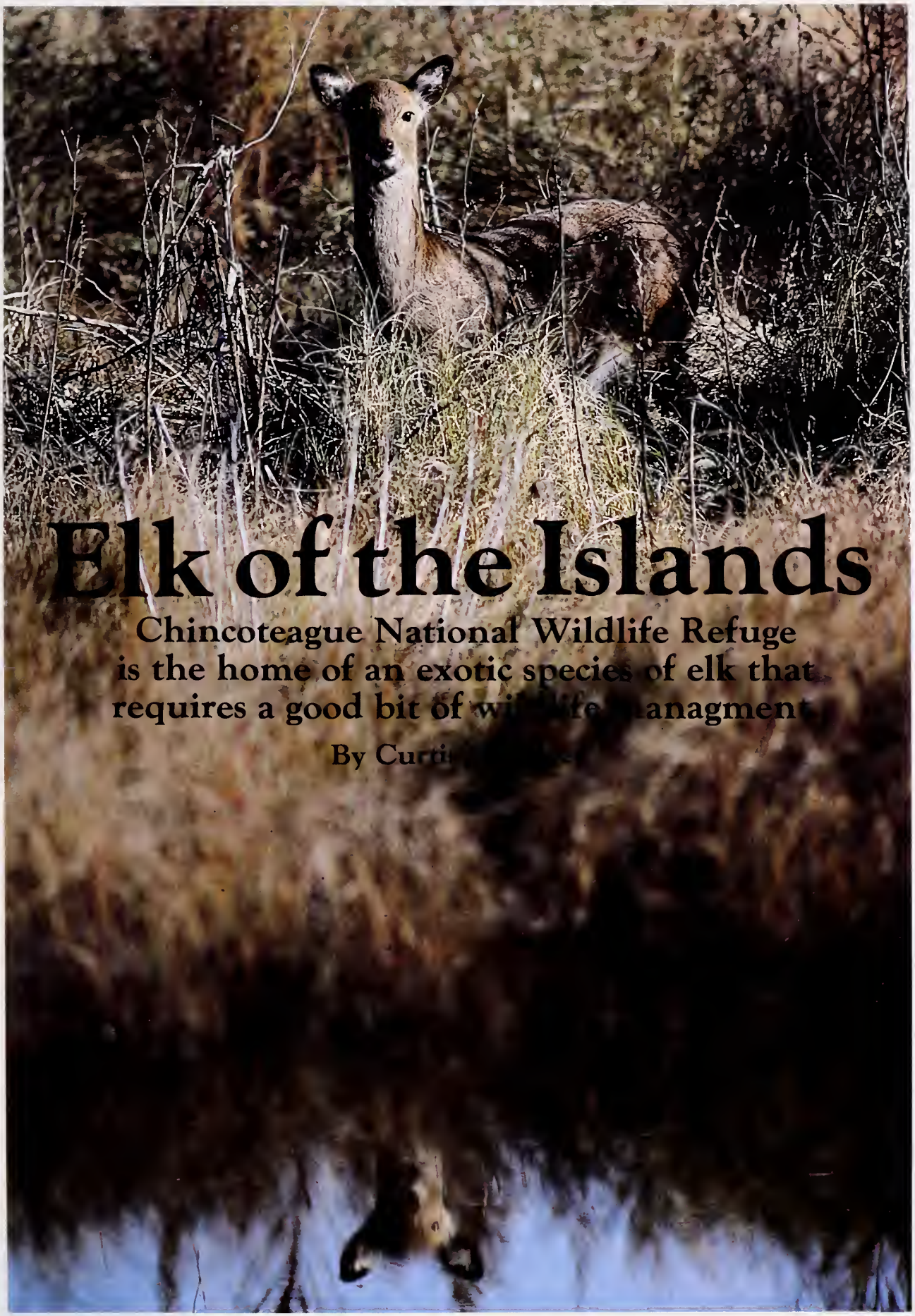
I'm older now and others I love have gone over the far ridge from which there is no return. But others have come on. My own boys watched as I left on hunting trips, and then they went along. Now they are almost men.

Maybe they'll have youngsters who will dust my floor with themselves while I rock and read. I don't feel much like a Grandpa with twinkling eyes and an ever-flowing mouth. But when my youngest, Andy, is cold and tired and far from home, and I still see him plodding wordlessly along in my wake, not complaining and not wishing he were somewhere else, I feel what I now know my grandfather felt.

Pride and love and hope.

Now when I pick up my gun and go to the big woods alone, I realize that maybe there is a constant in this world of shifting sands. I realize that when I reach the crest of the far hill, there will be a pair of young eyes watching me from the yard.

The eyes of one who dares to dream and dares to hope . . . □



Elk of the Islands

Chincoteague National Wildlife Refuge is the home of an exotic species of elk that requires a good bit of wi[illegible]anagment

By Curti[illegible]

Chincoteague National Wildlife refuge on Assateague Island is well-known for its great flocks of wintering waterfowl, and the Assateague National Seashore in the summer attracts as many bathers and sun worshippers as the refuge does snow geese in December.

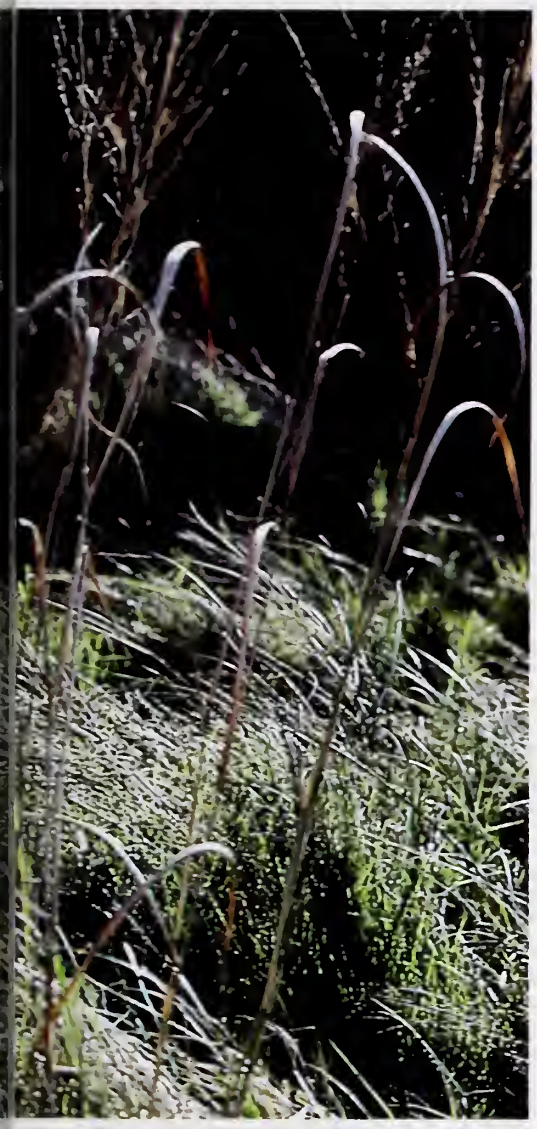
But what most of the bathers and birdwatchers don't know is that each fall since 1964 the Assateague refuge has been the site of a major big game hunt, during which an average of nearly 100 deer and elk have been killed each year. The irony of a wildlife refuge inviting gun-totin' hunters into its sacred confines is apparent—sort of like the farmer inviting the fox into the chicken house. But before you compose your scathing and indignant letter of protest to your congressman, let us explain that the fall hunt is legal, ethical, and a valid tool of wildlife management.

Few people realize that elk can be legally hunted in Virginia, let alone in a wildlife refuge on a barrier island. The elk in question here are of the Oriental variety, popularly known as sika (pronounced seek-a) deer. They are considerably smaller than their North American cousins, smaller even than the native whitetail deer whose habitat they share.

Sikas are an exotic species, introduced to Assateague Island in 1923. Like many other imported species, the sikas have thrived in this country, and the fall hunts are necessary to maintain a healthy herd, and to prevent the sikas from becoming the kudzu of the animal kingdom.

But there is more to the sika story than just an opportunity for an unusual

"To hunt Oriental elk on a barrier island sanctuary is a rare opportunity."



(Page 11) Sika deer: photo by Curtis J. Badger. (Left) The sika deer on Chincoteague National Wildlife Refuge are the only huntable elk population in Virginia; photo by Curtis J. Badger. (Above) A small and hardy exotic species, sika deer tend to compete with the native whitetail for food and cover; photo by Page Chichester.

hunting experience. Because the animals are confined to an island, wildlife biologists have an unprecedented opportunity for research. It is as if the island were an outdoor laboratory, a microcosm of the larger world of animal, habitat, and man-as-hunter. Here, scientists can study the effects of an exotic on native species, the population/habitat equation can be closely measured, and the use of hunting as a wildlife management tool can be evaluated. So sikas give us not only the opportunity for an exotic hunt, but an occasion to examine the effect of the hunt on the species.

Like most exotics, when sikas were brought to this country, their natural predators were left behind. So, like starlings, English sparrows, and the ubiquitous kudzu, their numbers have multiplied. Hence the reintroduction of man as predator.

A Few Sikas Multiply Into A Big Problem

In 1916, Clemment Henry released four or five sika deer on James Island, which lies on the eastern shore of the Chesapeake in Dorchester County, Maryland. The little herd grew quickly, and in a few years the deer had extended their range to nearby Taylor's Island and to the mainland.

Four years later, in 1920, Dr. Charles Law of Berlin, Maryland purchased five sikas from a Cambridge man and placed them in a pen at his home. He kept the deer for three years, then sold them to a man who released them on the north (Maryland) end of Assateague Island. Like the sikas released a few years earlier on James Island, the Assateague herd thrived in its new home, with most of the animals moving south to the Virginia portion of the island. Despite considerable illegal hunting, the number of animals on the island continued to grow.

The Chincoteague National Wildlife Refuge was created in 1943, and in the years following World War II, efforts were stepped up to control poaching on the island. By 1963, the sika population had grown to more than 1000 animals, and a browse line had become evident. Biologists feared that the population was becoming too great for the fragile

island habitat to sustain. Refuge managers realized that something had to be done—*soon.*

Of concern to the biologists at Assateague was a tragedy that had befallen the James Island sika herd during the winter of 1957-58. In the fall of 1957, the sika population on the tiny island was estimated at 270, and the habitat was apparently overbrowsed. That winter the herd experienced a massive die-off, and in April, biologists collected the skulls of 161 animals that had died of starvation. So, 51 years after their introduction on James Island, the herd had succumbed to the cruelest kind of population control. Coincidentally, the winter of 1964 would be the sika's fifty-first on Assateague.

Biologists explored two options. They could trap a number of animals and transfer them to a mainland site, or they could open the refuge to controlled public hunting. Initially, the first option seemed preferable. A bridge and causeway linking Assateague with Chincoteague Island and the mainland was being completed. Soon there would be tens of thousands of tourists visiting the island, and a public hunt might not be a politically wise decision.

Virginia's wildlife management officials balked at the trap and transfer plan, however, fearing the effect the exotic sikas would have on the native whitetails. Those worries were certainly legitimate, particularly in view of instances in New Zealand and Texas in which sikas proved capable of supplanting sympatric species of deer.

And, a few years later, in nearby Dorchester County, Maryland, these concerns proved valid. The few sika deer that were released on James Island in 1916 had spread to the mainland, and by the 1970s they were rivaling the whitetail in the annual deer harvest. In 1973, only 16 percent of the deer killed in Dorchester were sikas, but by 1977 that figure had increased to 42 percent. In 1976, the state increased the allowable bag limit for sikas and decreased the limit on whitetails. Meanwhile, the sikas had increased their range to occupy three counties on Maryland's Eastern Shore.

But, in addition to these management concerns, it was soon discovered that the trap and transfer plan alternative proposed in Virginia was expensive and inefficient. The refuge instead would open its doors to hunters in the fall of 1964.

The decision to allow hunting on the refuge certainly required courage on the part of the refuge management, and now, after more than twenty seasons, it is apparent that their decision was the right one. Still, there are preservationists who argue that the annual hunts are cruel and unnecessary. Can starvation, however, be more humane?

Refuge officials from the start have made every effort to see that the hunts are carried off without incident. The hunts are only allowed on areas outside the normal visiting areas, and stringent tests of shooting accuracy and hunting safety have been required. Hunting is allowed on nine separate tracts, and only one hunter or one two-hunter team is allowed per tract. In addition, the refuge has opened a separate area for hunters in wheelchairs, affording persons with physical disabilities a chance to hunt the area.

Prized in the Orient for the aphrodisiacal qualities of its antlers, the sika deer is also a prize for Virginia hunters; photo by Page Chichester.

In 1964, hunters took 238 sikas; the following year they killed 286. With the population checked, hunting efforts were curtailed over the next several years, but bag limits were expanded again in the mid-1970s, and whitetails were added to the list of legal game. Over the last five seasons, an average of 97.4 deer have been killed each year. The sika herd is maintained at approximately 700 animals, and with the population thus controlled, the number of whitetail on the refuge is increasing slightly (currently about 250). In recent years, sikas have accounted for about 80 percent of the deer bagged on the island. They are more plentiful than whitetails, and they are less wary.

Refuge officials say the hunts have helped maintain a healthy population of both species of deer, and there have been no reported mortalities due to malnutrition.

From Endangered Species to Pest

The sika is an Oriental species whose original range on the Asia mainland extended from Siberia and Manchuria south to Viet Nam, and throughout Japan and Formosa. Ironically, the majority of sika subspecies (there are an estimated seven to 13) are currently regarded as endangered in their native ranges, and some may exist only in countries where they have been introduced. But in many areas where sikas have been imported, their numbers have expanded to pest proportions. Sikas have a particular fondness for the tender young shoots of corn and other grain crops, making them understandably unwelcome by the agricultural community.

New Zealand, with no native species of deer, introduced sikas in 1900. Population density became so great in many areas that severe damage to the habitat occurred. To protect farm and pasture land, the goverment instituted liberal hunting regulations, large-scale poisoning campaigns, and aerial culling operations. In areas of Russia where sikas have been introduced, the government has suggested that an effort be made to increase the population of wolves to keep the sikas in check.

The sika does have its admirers, though. As the success of the Chincoteague Refuge hunt indicates, the little elk can be a very successful game animal. On a more exotic note, sikas are greatly in demand in some areas because it is believed that their antlers, when in velvet, are an aphrodisiac. In the Soviet Union, 10,000 to 20,000 sikas and red deer are kept in captivity so the velvet from their antlers can be obtained. In Japan in the 1920s, sikas were killed in great numbers for their velvet-covered antlers. A good pair of antlers would sell for approximately $100 in 1929, and the animals were hunted to the brink of extinction.

The sika's success in this country is possibly a result of its ability to adapt to different habitats. If it's green and leafy, chances are the sikas will eat it.

At the Chincoteague refuge, sikas can be seen in upland forests munching on poison ivy and greenbrier, and they are frequently spotted in early morning grazing along the roadside on grass and honeysuckle. Neither is it uncommon to see them standing knee-deep in a freshwater impoundment with green threads of marsh grass and duckweed dangling from their jaws.

Sikas are also able to adapt to a variety of climates. They have been successfully introduced in Great Britain, Denmark, and other European countries, as well as in Russia, Australia, and New Zealand. They adapt well to parks, and are seen in game farms in several states, principally Texas, where they are classified as a non-game animal with the same legal status as domestic livestock.

Sikas are smaller than whitetail deer, standing 2½ to 3 feet tall at the shoulders and weighing 100 to 120 pounds. Field dressed deer two years old and older checked in at Assategue have ranged from 39 to 90 pounds for males, and 37 to 62 pounds for females.

Aside from the size differential, sikas are otherwise distinguishable from whitetails by their small, rounded ears and their conspicuous white rump patch. Even adult sikas have the faint white spots common to the whitetail fawn. In winter, the spots may be indistinct or absent, but in the summer they are more apparent. Also, the sika's antlers are smaller than those of the whitetail, usually with only two or three points on the forward edge and none on the hind edge.

Many feel that the sika is not as beautiful or as graceful as the whitetail. But there are those who hold the little elk in high esteem. Japan has, since 1955, considered the sika a "national monument" and has afforded it full protection, planting special forage crops and eliminating competing species. Could it be that the aphrodisiacal qualities of its antlers has something to do with that?

To my knowledge, no one has substantiated this Oriental idea on the Assateague animals, but hunters still sing their praises each fall when the season opens. To hunt Oriental elk on a barrier island sanctuary is a rare opportunity. A few hundred yards eastward, the Atlantic Ocean crashes upon the sandy beach, and in the nearby fresh water impoundments Canada geese and snow geese gather by the thousands. It is a hunt to be remembered. □

So You Want to Hunt Sika Deer? Here's What You Need to Know

If you are interested in participating in the Chincoteague Refuge hunts, write at the end of August for the fall hunt information packet. Refuge officials say that hunting regulations vary from year to year, but the general pattern has been to bring refuge regulations in line with state laws. In 1985, for example, the archery and firearms seasons ran the same dates as the state seasons for Accomack County.

Hunters can use either bows or firearms (rifles, slugs, or pistols), and appropriate state licenses must be secured. Last year, hunting with firearms was not allowed on weekends, although bow hunting was allowed on Saturdays.

In 1985, the refuge opened nine compartments (areas) for hunting. Only one hunter or one two-hunter team was allowed on each compartment. Bag limit was three deer of either sex per year.

Because more hunters applied for firearm permits than were available, a lottery was held prior to the 1985 season to select hunters that would be given access. The lottery was not necessary during the archery season.

Since the popularity of the hunt seems to be increasing, chances are there will be a drawing for firearms permits next year. The information packet the refuge will send you will have lottery information, as well as hunting regulations and instructions on sign-in and check-out procedures. All deer killed on the refuge must be tagged according to state regulations, plus refuge biologists examine them for disease and evidence of malnutrition.

The refuge also has a hunt in a separate area for persons in wheelchairs. In 1985 the hunt was held during the second week of the regular season. Five hunters are allowed on a 1.6 mile paved trail. Three hunters took six deer last year.

In 1984, 60 deer were taken with firearms and 22 with bows. Seventy-nine percent of the deer taken were sikas, 21 percent were whitetails.

Hunting regulations depend on the size of the sika population, and the number of permits issued varies with the need to cull the herd. If you want to hunt, the best advice would be to mark you calendar now, write for information in August, and hope that your luck holds in the lottery.

The address is Chincoteague National Wildlife Refuge, P.O. Box 62, Chincoteague, VA, 23336. □

Over 300 species of birds have found refuge on Assateague Island, famed wild ponies have made a home there, and 1½ million people each year seek out their own kind of refuge in its marshes and on its beaches.

(Page 18) The mute swan, a Chincoteague National Wildlife Refuge visitor in the winter, is originally from Eurasia, and was first introduced into parks and zoos in the United States. It has now become well established in the wild.

An Island Refuge:

A Photo Essay

by Page Chichester
text by Curtis J. Badger

Chincoteague is a island with two distinct personalities. From Memorial Day to Labor Day it is loud and bright. It is a dubious host. It is convivial, although a bit crowded, as week-end tourists line Mattox Boulevard for a short drive to the beach at Assateague. In the summer, the beach belongs to the tourists, some one and a half million of them each year. They weave an impressive tapestry of color upon the sand; red blankets, yellow umbrellas, multi-color swimsuits, and human bodies roasted in tones covering the spectrum from painful pink to burnt umber. The Atlantic crashes upon the sand, forming a bass counterpoint to the shrill screams of children. Salt air is puntuctuated by the smell of coconut oil.

But as the tourist season passes, the island takes on a different mood. The time of Chincoteague is no longer bumper to bumper. Restaurants and tourist shops are battened down for the winter. And on Assateague, the first gray storm of winter screams away memories of summer. The island suddenly becomes wild again. Laughing gulls have departed, and in their place come battalions of snow geese and Canada geese, pintails and mallards; birds of the far north who will spend the winter with us here.

Except for a few hearty souls, the beach is empty. There are still a few visitors, but these explore the pine woods and marsh with spotting scopes and field guides. In winter, wildlife predominates and man is the visitor, an outsider who is allowed only a brief glimpse of the thousands of waterfowl whose turn it is to use the refuge as a vacation spa.

I avoid Assateague in the summer. I realize that it is selfish to resent city dwellers who are there in the summer, but the notion of turning this wild beach into a poolside coconut oil ghetto is repugnant. It is like canoeing in a special perfect creek when a motor boat roars by, belching its engine by-products and leaving a sheen of oil in its wake. Even after the boat has disappeared and the wave has fallen, the creek is ruined for the day.

Winter is a perfect time to visit the island. The wind numbs your face and the sand swirls around you. The sea ducks bob about in the surf, and across the dunes a spiraling flock of snow geese touch down in the marsh.

It is this aspect of the island's personality that gives me peace and fulfillment. And I suppose it is wrong of me to fault those who find the same values in the island's other incarnation. I like to think that I'm generous enough to appreciate their point of view. But in truth, I know my limits. Deep down, I know that Chincoteague was meant to be wild. □

Yellowlegs were often called "tattlers" by old duck hunters, because of their wary disposition and quick flushing warnings. The greater and lesser Yellowlegs pictured here are similar in plumage, but not in size. The Greater is about 14″, the Lesser from 10″ to 11″. The Greater has a longer, slightly upturned bill, while the Lesser has a shorter and straighter bill. Both species winter at the Chincoteague National Wildlife Refuge.

Chincoteague National Wildlife Refuge was purchased by the U.S. Fish and Wildlife Service in 1943. The name is a misnomer, though, since the refuge's only link to Chincoteague is by a bridge that connects Chincoteague to Assateague Island. Chincoteague National Wildlife Refuge encompasses the entire Virginia portion of Assateague Island, and is open all year to the public.

A Look At One of Virginia's Marsh-Loving Mammals

Ol' Musquash

by Carl "Spike" Knuth
photos by Leonard Lee Rue

There is something peaceful and restful about a calm, backwater, marshy slough of a river or lake in late February. The air may still be crisp and fresh, but the sun is warm with a hint of the coming spring. Suddenly and quietly, on the smooth water mirroring budding trees, a curious disturbance appears. A wake of something swimming becomes detectable. Closer examination reveals a head scarcely above water, turning this way and that—a pair of black, beady eyes searching the shore.

Late winter in Virginia is when the muskrats begin to disperse for the new breeding season. A number of them may have lived together during the winter, possibly even sleeping together during severe weather. But now the males are a little short-tempered with one another and they strike out to establish a territory for breeding.

The muskrat, a native North American of coastal and inland marshes, lakes, ponds and rivers, is a large, stocky, heavily-furred aquatic rodent. It has small eyes, ears, short legs and a long, scaly, vertically-flattened tail. It is not unlike a meadow mouse of giant proportions.

The muskrat gets its name from a pair of perineal glands under the skin on its lower abdomen. These glands enlarge during the breeding season, giving off a yellowish, sweet-odored secretion which is very strong and penetrating. Mixed with urine, the secretions are deposited within its territory. It serves to warn off other males and to attract females.

French trappers called it "le rat musque," while the Algonquin Indians called it "musquash." Its scientific name is *Ondatra zibethicus*; "ondatra" from the Iroquois Indian name for the animal, and "zibethicus" from a Latin word meaning "musky-odored." Some of its common names include mushrat, muskbeaver and marsh hare. To the furriers, it has been known as Hudson seal, Red River seal, Bisam mink, river mink, water mink, velvet coney and plucked beaver.

The muskrat is a good diver and excellent swimmer. It propels itself with its powerful and webbed hind feet as its shorter front legs are held in a folded position under its chin. It is capable of staying underwater for 10 minutes or more. The muskrat can feed underwater due to the folds of skin which close behind its teeth, allowing it

to cut stems or dig roots and tubers without getting water in its mouth. Its four, dark yellow, incisor teeth used for gnawing grow continuously and are self-sharpening. On each side of its mouth are three molars for chewing and grinding.

Cattails, three-square bulrush, pickerelweed, spatterdock, arrowleaf, water lily, coontail, wild rice, water milfoil, wild celery, and musk grass are some of the preferred foods of the muskrat. Their favorites, of course, depend on what is predominant within their home area. For example, in the Chesapeake Bay area, they seem to favor narrowleaf cattail, three-square bulrush and cordgrass. They will even leave the water to eat corn—providing it is not too far away. When they eat, they'll cut sections of stem eight to 10 inches long, holding them in their front feet while sitting on their haunches. They will also dig up roots and tubers of cattails, spatterdock, water lily and arrowleaf (duck potato) from the bottom.

Muskrats also have been known to dine on snails, crayfish, frogs, fish, salamanders and mollusks. A pile of clam shells in some isolated spot in a marsh or river bank usually indicates where a muskrat was gorging on clams. Much of the animal matter they consume is eaten during the winter, when they dig up hibernating creatures. While they themselves do not hibernate, muskrats do store up food for the winter as do hibernating mammals. They will also scavenge on dead birds, fish and mammals during hard times, and in a pinch, the muskrat always has the option of eating its home to survive.

Muskrats utilize a variety of habitat types as long as they are associated with water. They inhabit city park lagoons and ponds, mountain streams, coastal marshes, canals, marsh sloughs and potholes, rivers and farm ponds. They can also survive in polluted water. In Virginia's coastal areas, they commonly inhabit brackish water marshes. About the only thing muskrats can't tolerate is excessive and frequent water level fluctuations. They prefer still or slow-moving water with an abundance of succulent vegetation along the shore or in the shallows. Their territory ranges over an area about three quarters the size of a football field.

Home building is no problem for a muskrat. Their small front feet are equipped with four clawed toes and a nailed thumb useful for its digging chores. Their large hind feet are considerably longer than their front feet, and have five clawed toes that are webbed at their bases. The toes, webs and feet themselves are edged with stiff hairs, while the soles of the feet contain tubercles which give them traction on the slippery marsh vegetation. Thus, they may dig out a den in a bank or build a lodge out in the middle of a marsh slough or at the edge of a cattail bed in a pond.

In marshes or other shallow waters, muskrats construct a lodge of aquatic vegetation, usually with a foundation of roots and other underwater support. The mound-like den is up to four feet high and eight feet in diameter (although many are much smaller), and is made of stems, roots, grasses and mud. The walls are about a foot thick and serve to insulate the muskrat family from both heat and cold. The nest chambers are connected by tunnels to the water. Much of the construction material of mud and weedy debris comes from the bottom, which aids the muskrat in deepening areas around the lodge and trails to and from the lodge.

The tunnels or channels that they dig lead from home to deeper water and connect to surface trails and feeding grounds. They dig out the channels with their front feet, throwing material up with their back feet. The debris is piled up in one spot, forming platforms for feeding, resting and defecating. These feeding stations may become as big as a den lodge, while others are floating rafts of vegetation.

Underwater channels are critical to the muskrat in winter if the water should freeze to the bottom. Muskrats must have at least three inches of water under ice to move around in. Frequently, they'll dig a channel through the mud under a freeze-out. During a severe freeze-out, however, muskrats are forced to evacuate the area to find new living quarters.

I recall one winter on Wisconsin's Lake Winnebago while I was wandering the icy shore in early-December. I was surprised by a dark form suddenly emerging from beneath the ice at a small opening in the ice. It turned out to be a lone muskrat. He had apparently been forced from the marshes or was a young-of-the-year forced to take up residence in marginal habitat at best—in this case, the large rocks piled up as breakwater on the lakeshore. This in itself was suicide, since mink, the main predator of the muskrat, prowled these rocks in good numbers. The muskrat appeared to be munching quite contentedly, but the next morning his still form lay silently frozen on the ice where he had emerged.

Beginning in early spring, muskrats begin breeding and continue through May. Two or three litters are common from March through September, but as many as five are possible if conditions are ideal. Litters may number anywhere from one to 12, and the young are born blind, naked and helpless. They grow very fast and are able to swim and dive at about two weeks of age. Within a month they are weaned, and are adult size of 17 to 25 inches and 2 to 3¾ pounds after six months. The female is usually about ready for her next litter when her first reaches adulthood. In late summer and early fall, all young 'rats are forced to leave their home territory—Nature's way of dispersing the population and keeping numbers within the limit of the food supply. At this time, these "runner rats" show up in some unusual places such as city streets and backyards while trying to relocate.

The life span of the muskrat is short, with mortality being especially heavy among young muskrats. Only an estimated 30 to 40 percent of the young rats live into their first winter. Some 50 to 80 percent die annually from predation, starvation, drought, flooding and disease. A four-year-old muskrat is considered quite old.

Among the muskrat's chief predators are snapping turtles, large fish, hawks, owls, foxes, weasels, raccoons, and mink. Mink will go right into the den after young and adult muskrats alike. While muskrats are scrappy fighters, they are no match for the lightning quick carnivores.

Ol' Musquash is a favorite of both amateur and professional trappers alike due to its numbers, wide distribution and relative ease of catching and handling. In fact, only a few parts of California, Georgia, South Carolina, much of Texas, most of Florida and scattered arid regions do not host muskrats, and many active trappers today cut their

Ol' Musquash

Excellent swimmers, muskrats can stay submerged for 10 minutes at a time.

"trapping teeth" on the muskrat.

Being one of the most widely distributed of American fur-bearing animals, the muskrat produces more fur pelts than any other mammal. Its fur is dense, sleek and waterproof. The back of the adult is a dark, brownish-black, while its sides are lighter brown with a reddish—sometimes yellowish—tinge. Its underparts are lighter, shading to white on the throat. The underfur showing through has a grayish, silvery cast. Muskrats may vary considerably in overall color. Some are almost black, while others are reddish, tan or almost white. Young 'rats are duller looking; grayer on their backs and paler on their sides.

Muskrat fur has good wearing quality and more than 10 million pelts a year are marketed in the United States and Canada, with a market value of $30 million or more. Louisiana alone produces three million pelts annually. Most pelts are used for women's coats and are considered a fair imitation of the more costly seal. The fur of the adult is more prime than the juvenile, and most prime in the late-winter or early-spring. Dried musk from its glands is used in the manufacture of perfumes and for preparing scent for trapping.

Like many other creatures of the wild, muskrats can be both beneficial or pesty. 'Rats living in a marsh tend to open up ponds which provide extra resting, feeding and nesting places for waterfowl. On the other hand, muskrats that burrow into dykes, dams or banks, threaten the manmade ponds and lakes. In fact, they have become a serious problem in parts of Europe where they were introduced in 1905. In the Netherlands, with all of its dykes and waterways, the muskrat has become the main target of trappers who are paid a bounty to trap them. Despite the heavy pressure on the muskrat populations, however, they continue to thrive, showing that if the habitat is available, the animal will prosper—no matter what other pressure man exerts.

The muskrat is a resilient and prolific creature and replenishes its population quickly, even though much of its original habitat here in the U.S. has been destroyed due to land drainage and loss of marshlands. As long as man can save what little marshland remains, though, there will always be a muskrat's wake cutting the calm surface of a still water marsh. □

Airborne Scavengers

Scientists are developing a new respect for Virginia's most maligned birds—the vultures.

by Keith A. Wilkins

Ugly, ungainly, foul smelling . . . fascinating, social, graceful.

What may appear to be a study in contradictions is, in fact, a fairly accurate description of two species of Virginia wildlife being researched at Virginia Tech. Fisheries and wildlife professor Jim Fraser is studying the black and turkey vultures in the state.

A very good reason for his interest in these birds is that, despite their being common to the state, very little is known about their range, habits, mating, and foraging regimes. Also, there are many people who regard vultures as dirty pests and nuisances, often congregating in areas where people do not appreciate them. Some people even fear that they may be harbingers of diseases. All of this suggests a need for improved management practices in relation to Virginia's black and turkey vultures.

But better management practices, the Tech scientists say, can't very well be initiated without an adequate understanding of these birds. Much more needs to be learned about their mating, roosting, social, feeding, and range habits, as well as their preferences for certain locations. And since the black and turkey vultures are closely related to the nearly extinct California Condor—with only about twenty left on Earth—the result of vulture research could very well provide essential insights into ways for preventing this endangered species from becoming extinct altogether.

Additionally, the Tech scientists believe that vultures might well serve as environmental monitors. They are near the top of the food chain, which means they have the potential for picking up various contaminants, such as pesticides or harmful industrial by-products that may have been ingested by fish or animals that subsequently die or are killed and then eaten by the vultures. The amount of contaminants in the vultures would provide clues to what might be happening in the environment in which we live.

Fortunately, there are quite a few vulture roosts here in the state. Reputedly, one of the largest in North America is located in the vicinity of the Radford Army Ammunition Plant at Radford, Virginia. Another large roost is at the Gettysburg National Military Park at Gettysburg, and there are roosts along Virginia's Eastern Shore and the Chesapeake Bay.

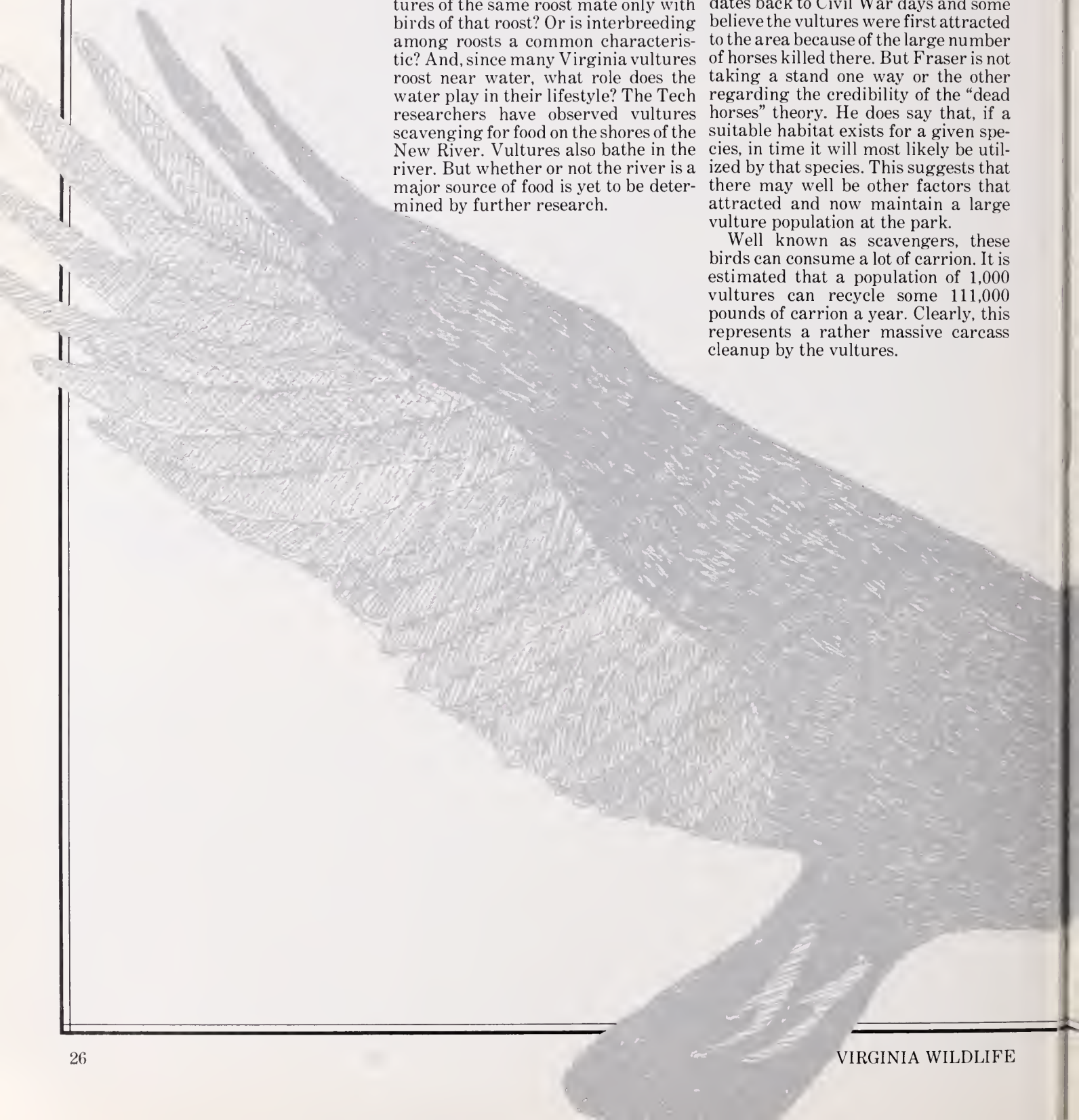
From data gathered to date, Fraser explains, the number of birds occupying a roost fluctuate over time. For instance, during the winter some 1,000 vultures may occupy the main roost at the Radford arsenal. In summer, as the breeding season begins, they spread out to peripheral roosts up to twelve miles distant.

Such data raises questions. Do vultures of the same roost mate only with birds of that roost? Or is interbreeding among roosts a common characteristic? And, since many Virginia vultures roost near water, what role does the water play in their lifestyle? The Tech researchers have observed vultures scavenging for food on the shores of the New River. Vultures also bathe in the river. But whether or not the river is a major source of food is yet to be determined by further research.

Some of the unknowns relating to roosting habits and preferences for certain localities will, it is hoped, become clearer as the result of the Tech research, particularly that being carried out at the Gettysburg park, where the park service has identified the vultures as a species to be given special recognition and attention.

Apparently, the Gettysburg roost dates back to Civil War days and some believe the vultures were first attracted to the area because of the large number of horses killed there. But Fraser is not taking a stand one way or the other regarding the credibility of the "dead horses" theory. He does say that, if a suitable habitat exists for a given species, in time it will most likely be utilized by that species. This suggests that there may well be other factors that attracted and now maintain a large vulture population at the park.

Well known as scavengers, these birds can consume a lot of carrion. It is estimated that a population of 1,000 vultures can recycle some 111,000 pounds of carrion a year. Clearly, this represents a rather massive carcass cleanup by the vultures.



Vultures also contribute an aesthetic aspect to our recreational areas, parks and to our enjoyment of the great outdoors. For, despite their ungainly appearance on the ground, in the air they are masters of flight. One of the major attractions at the Gettysburg park is the great many vultures, which provide visitors with many hours of entertainment as they swoop and soar above the park area.

An interesting aspect of these birds, and not widely known, is that those soaring vultures we so often see in Virginia skies may not be only looking for food. There is evidence, Tech researchers explain, that high-flying vultures are on a cross-country jaunt. On such trips, the birds take advantage of air thermals to gain altitude, and when they exhaust the thermal's life, they soar down until they locate another, then rise again, and thus make their way over the countryside with barely a flap of their enormous wings.

Food hunting, Fraser says, actually takes place closer to the ground, especially in the case of the turkey vulture. These birds conduct their quest by skimming along just above the trees, using their highly developed sense of smell, a rarity in most birds.

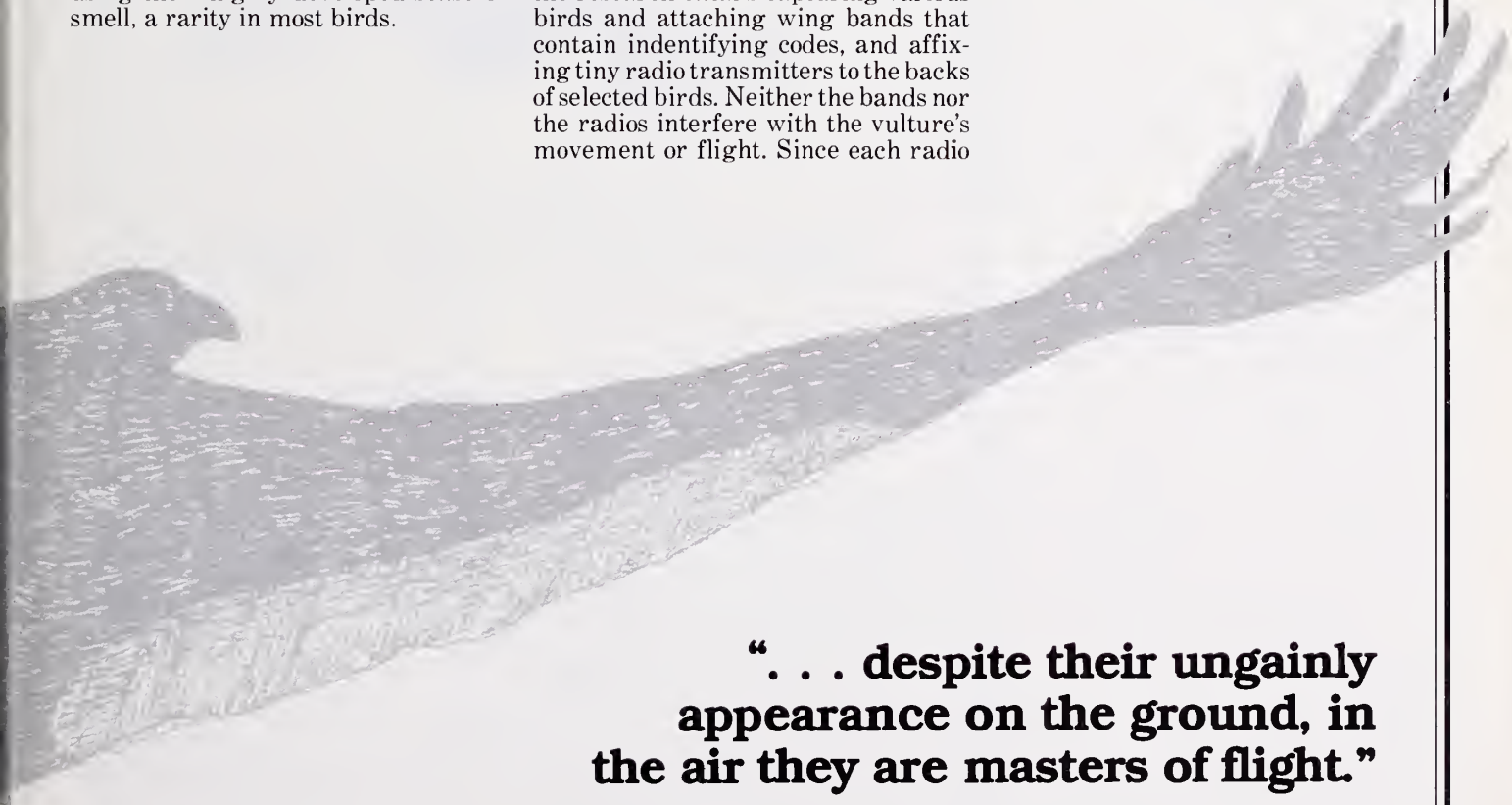
Black vultures apparently do not share this olfactory keeness, for they often follow the turkey vultures and when food is found, they swoop down and take it away from the turkey vultures, much in the manner of a pack of wolves. In fact, black vultures have been called "flying wolves." Black vultures can also be differentiated from turkey vultures by white patches on their undersides, near their wing tips, and by their short tails and lighter colored legs.

When the Virginia Tech research is completed, it is hoped that the results will provide greater information regarding the summer home range of Virginia vultures and their foraging distances from roosts. The results should produce greater understanding of the birds' habitats and why they prefer one over another. Fraser hopes, too, to be able to determine if suitable feeding areas exist elsewhere in Virginia that would attract large numbers of vultures and to describe such places.

An integral part of the Tech research involves being able to identify individual vultures so that bird movement can be traced and habits observed. Part of the research entails capturing various birds and attaching wing bands that contain indentifying codes, and affixing tiny radio transmitters to the backs of selected birds. Neither the bands nor the radios interfere with the vulture's movement or flight. Since each radio transmits on a different frequency, the movement of individual birds can be monitored through a simple triangulation techinque. Radio equipped birds can also be followed by aircraft and automobile. To capture the vultures, the Tech team uses walk-in traps, noose carpets, and cannon nets. The latter can be fired in the air so they fall upon a single bird or small group of birds. But, the process of capturing and banding the vultures is not without its distasteful effects. Vultures have the rather uncouth habit of throwing up on their captors. They also defecate on their own feet, as a means of cooling them.

Nevertheless, Fraser and his associates do find vultures to be a very fascinating research effort and a species that seems destined to become recognized as an integral part of the total ecosystem.

And, Fraser says, "I don't even notice their foul smell anymore." □



". . . despite their ungainly appearance on the ground, in the air they are masters of flight."

This tiny amphibian, once a pet store oddity, has become a threat to the native inhabitants of our freshwater ecosystems.

The Clawed Frog

An Exotic From South Africa Invades Virginia

by Gregory A. Zell

A new and unwanted guest has taken up residence in Virginia waters. *Xenopus laevis*, otherwise known as the South African clawed frog, may soon join the ranks of such pests as the European starling, walking catfish, and the piranha in posing a serious threat to native wildlife.

Xenopus laevis is at first glance an unassuming and quite entertaining member of the Amphibia. It was first imported to the U.S. in the 1940's and used extensively for human pregnancy testing—until it became cheaper to use native frogs and rabbits for such tests. In recent years, however, increased demand for use in classroom studies and by pet stores has encouraged several large biological supply companies to commercially breed the

clawed frog across the country. Between the years 1970-71, almost two million exotic frogs and toads were legally imported into the U.S, including over 200,000 clawed frogs.

Why all this fuss over a pet store oddity? Because this primitive frog is quite unlike any of its North American relatives. It is totally aquatic, its body ideally designed for a life underwater. A triangular head and flattened body offer little resistance to movement, while the large and powerful fully-webbed rear feet propel it rapidly through the water. Lacking a tongue, its weak forelimbs that end in delicate "fingers," are used for the sole purpose of stuffing food into its waiting mouth. An aggressive feeder with a voracious appetite, it will hunt or scavenge without discrimination, consuming most anything which will fit into its mouth, including the eggs and larvae of all our native fish and amphibians.

Primarily nocturnal, the frog prefers to hide by day among submerged vegetation or beneath rock walls and crevices. Although it has excellent eyesight, it is capable of locating prey through its highly developed sense of smell alone. Completely missing in native frogs, Xenopus has also retained a special sense of "touch" (the same mechanism which keeps fish from bumping into the glass sides of an aquarium) which is an aid in capturing prey as well as escaping from enemies. The only trouble is, the frog doesn't have many enemies. If captured, a neurotoxic secretion in the skin would convince most predators that the clawed frog looks better than it tastes. And, when frightened, they rapidly burrow into mud for protection or slip and slide away from would be captors because of the slippery, slimy mucous membrane covering their skins. Combine all this with the understanding that: Xenophus has a high range of temperature tolerances; can tolerate salinities up to 40% seawater; easily hibernates under stressful conditions; has the ability to change colors to avoid detection; breeds several times per season; lays eggs which hatch in 50 hours and develop rapidly; is immune to most diseases; and is highly resistant to chemical control—and you have the picture of an animal determined to survive wherever it's dropped off.

And that's the problem. Escaped clawed frogs were first discovered in Orange County, California in 1968, and field studies have found the frog to be a serious threat to native fish and amphibians. Trapping, seining, poisoning, and the draining of ponds have all been tried in an effort to eradicate the frog, but have so far been unsuccessful. Instead, the frog has spread rapidly in Southern California, and has been reported in Arizona.

"In August, 1982, a single pond was discovered in Virginia containing the only documented wild populations of the clawed frog in the eastern United States."

In August, 1982, a single pond was discovered in Virginia containing the only documented wild populations of the clawed frog in the eastern United States. How the colony began is anyone's guess, but most likely it occurred with the release of laboratory specimens or aquarium pets.

Soon after the amphibians were identified, a frog-proof fence was erected to prevent escape through migration. And, true to its exotic and hardy nature, the clawed frog population has already displaced several native species in that Virginia pond. Within the first twelve month period after their discovery, two native species, the spotted salamander and the wood frog, disappeared from the pond. So far, the colony has resisted three separate eradication attempts, but it does provide the opportunity for observation of the species in the wild.

Though it was thought that the frog was unable to survive the winter temperatures of northern Virginia, trapping records indicate otherwise. Adults hibernate rapidly with the onset of sustained freezing temperatures, but subadults of various age groups remain not only active, but feed heavily in water temperatures from 36-42°F.

In an attempt to find a natural control for the population, clawed frogs were offered as food items to several different species of fish common to Virginia waters. Small frogs were offered to adult bluegill and black crappie, channel catfish and American eel. All declined to feed or even strike the frogs. A 10" largemouth bass did hit a 1 ½" frog, but took over 10 minutes to swallow it. Thus, it is unlikely that any of our native fish can successfully control a population of adult frogs.

In Virginia, the situation is presently under control, yet the future remains unpredictable. It is most unlikely that Virginia harbors the only Xenopus population in the East, considering the fact that all southeastern states furnish not only an ideal climate but preferred habitat as well. The highly adaptable clawed frog has few limitations on where it can live. High salinity and swift flowing water appear to be the only limiting factors. Most permanent bodies of water—small lakes, ponds, canals, swamps, fresh or brackish marshes, slow flowing creeks and rivers—may be suitable.

To complicate matters, it is most difficult to detect the presence of Xenopus without a trained eye. Breeding calls are made beneath the water and cannot be heard, and while adults and young frogs must surface regularly for air, the only reliable sign is a small telltale bubble of air which remains on the surface briefly. During the breeding season (June-September in Virginia), the schooling larvae are highly visible for a short period of time, but, resembling a feeding school of minnows from a distance, they go largely unnoticed by the general public. Soon changing into small frogs, they disappear beneath the surface to take up a solitary existence as hunters in the dark. Wildlife biologists admit they are fighting a losing battle with the clawed frog and can only hope that the impact of Xenopus on native wildlife will be minimal.

The problems caused by introduced species are nothing new to us—we live with them every day. Among the hundreds of animal species introduced into the United States since the 1600's, the story is always the same: either they quickly perish, unable to survive in a new environment, or they flourish and pose a serious threat to native wildlife. The tropical state of Florida alone counts well over 50 exotic animal species living and reproducing within its boundaries. The Old Dominion has thus far been lucky, owing to the inability of many exotics to tolerate our colder winter temperatures.

The final solution to the problems caused by the introduction of exotic animals, both in terms of economics and the displacement of native wildlife, boils down to a matter of responsibility and learning from past mistakes. We are talking about problems that can be avoided with foresight, education, and understanding. The clawed frog is just one irreversible mistake that could have been prevented. □

February Journal

Book Reviews

by Jeffrey M. Curtis

Waterfowl Carving with J.D. Sprankle
by Roger Schroeder and James D. Sprankle
Stackpole Books Harrisburg, Pa.
$39.95 hardback; 215 pages

How do you review a book like this? It's not fireside reading. Not reference material. Certainly not a common man's "how-to" book.

To describe this book, I'd say it's a complete carving course in decorative decoys put on paper. With words, a master carver goes one step at a time through the complete process involved in carving a gadwall drake.

J.D. Sprankle has the reputation of a master carver. After 70 first-place World Class championships and over 250 blue ribbons, his title would be hard to dispute. He first started carving 15 years ago because of dissatisfaction with factory decoys. He now lives on Kent Island, located on Maryland's Eastern Shore, where his carving classes are conducted. Says Sprankle in his book: "And I'm also fortunate to be working on this bay, a little piece of heaven, perhaps. Tan Brunet, who visited me recently, said, 'You can hunt here, you can sleep here, you can work here. What more would you want?' That's very true. What more would I want?" Indeed, what more could anybody want, except maybe to write a book of this quality about your work.

Carving is thoroughly enhanced with more than 400 photographs, both color and black and white by Roger Schroeder. Accompanying the photography are captions referring to specific features of the carving. It's well done.

Don't think that the book is general reading material about duck carving. It's not. *Waterfowl Carving*, written clearly, and beautifully illustrated, is a detailed and extensive blueprint for taking a block of basswood and massaging it into a piece of art.

The book includes patterns, photographs, painting instructions, and behavioral observations of 25 waterfowl species.

Waterfowl Carving will be around for a long while.

Perhaps not the book for the first-time carver, it would certainly serve as insight to technique as well as the importance of developing some camera proficiency and the powers of observation.

A lot of time and expense went into this book and the price reflects it. Although a bit expensive, you have to remember that there's 16 pages of color photos and nearly 400 good quality black and whites.

Waterfowl Carving with J.D. Sprankle is a textbook for the waterfowl enthusiast. □

History of the Sport of Casting, Golden Years
by Cliff Netherton
ACEF Publications, P.O. Box 261
Great Falls, VA 22066-0261
$14.95 paperback; $24.95 hardback
380 pages

Author Cliff Netherton has prepared a sequel book to the orginal *History of Sport Casting, Early Years*. This new book covers the sport of casting, the development of fishing tackle and rods for a period of about fifty years beginning in the early 1900's.

During this time, an emergence of technological advancement was realized in the development of fishing rods, reels, plugs and silk lines. With these improvements, the group of competition casters, both long distance and accuracy, had new equipment and standards with which to pursue their sport.

Golden Years provides a collection of black and white photos of pioneers in the casting fraternity. Such personalities as Abercromie and Fitch, A.F. "Gus" Meiselback, Homer Circle, Goodwin Granger, Edward J. Mills, Jr. and Izaak Walton League of America founder Will Dilg are given biographical sketches.

Hundreds of decades old advertisments of tackle and equipment have been added as part of the historical record. The illustrations include companies such as: Pflueger, South Bend, Heddon, Al Floss, Shakespeare, Arbogast, W.J. Jamison and L.J. Tooley.

Netherton has done a superb job of researching and gathering the material for this book. A collector of fishing equipment will surely find it valuable. The one drawback I found is for the non-collectors or beginners. The author has put an amazing effort into this book, but has kept his own narrative to a bare minimum. I would have liked to have heard more from Netherton, who is an enthusiastic and well read scholar of the art, with much to share with the reader. The author surely has advice on where a collector could start frequenting the fishing "flea markets" and shows. There is no telling how many ancedotes he could tell about gathering the vast volume of information for the book; people he'd met, equipment he'd seen and places he visited. A bit of *Netherton persona* would have made the book warmer, more familiar.

Golden Years gives great insight in to the people and companies that have contributed to making sportfishing what it is today. It is an effort that not only provides interesting reference material but contributes greatly as an accurate chronicle of a sport that many of us enjoy. □

About the Authors

A former Virginian, **David Catlin** is the author of *A Naturalist's Blue Ridge Parkway* and currently lives in Missouri. **Joel M. Vance** is the news writer for the Missouri Department of Conservation, and is a freelance writer for several national outdoor magazines. **Curtis J. Badger** is director of publications for the Wildfowl Art Museum of the Ward Foundation in Maryland, and is a frequent contributor to *Virginia Wildlife*. **Carl "Spike" Knuth** is TV and motion picture producer for the Commission and also a familiar name to *Virginia Wildlife* readers. **Keith A. Wilkins** is the research information officer for VPI & SU. **Gregory A. Zell** is a staff naturalist with the Arlington County Park Division. □

Hunt for the Handicapped a Success

The Virginia Deer Hunters Association started out the New Year with a hunt for 10 handicapped veterans and 15 youths in Chesterfield County. The hunt was the first of its kind sponsored by the organization, and nine deer were killed on a 1,700 acre tract owned by Senator E. Gray and Gray Lumber Company. Game Commission personnel volunteered their time for the event, by conducting a hunter safety education briefing before the hunt, and then assisting veterans and youths during the hunt. The Virginia Deer Hunters Association intends to continue this new and worthwhile tradition. Anyone interested in the association or this particular event should contact: Denny Quaiff, Virginia Deer Hunters Association, P.O. Box 34746, Richmond, VA 23234-0746. □

Letters

Keep Up The Good Work

Of all the books on the shelf, I'll take *Virginia Wildlife* for myself. I love the beautiful pictures of fish and fowl, the birds of land and sea, and the wise old owl.

I enjoy the tales some have to tell—I have had or seen the same as well.

Thank you, I'll enjoy this magazine for quite awhile.

C.G. Sours
Halifax

I really did enjoy reading the December issue of *Virginia Wildlife*. Every avid sportsperson should appreciate the outstanding articles on collecting decoys, wood carving, grouse and turkey hunting and especially the article on sporting gun dogs!

Excellent editorial.

Kit Shaffer
Lynchburg

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February Journal

Westvaco Supports Blaze Orange

There are 7,000 people who were safer while in the woods this year because they are wearing blaze orange vests provided by Westvaco Corporation in cooperation with Opertion RESPECT (Responsible and Educated Sportsmen Promoting Ethical Conduct Together). The emphasis of this special safety program is to reduce the number of hunting accidents by encouraging hunters to wear blaze orange.

The Timberlands Division, headquartered in Appomattox, which opens over 170,000 acres for public permit hunting, took the opportunity to promote the wearing of blaze orange among the sportsmen who hunt on Westvaco forestlands. Timberlands Division employees were given vests to wear while working in the woods during the hunting season. The remainder of the 4,100 vests purchased from Operation RESPECT were passed out to individual sportsmen who purchased their hunting permits at the Appomattox headquarters. Given along with each vest was a special brochure containing information on hunting accident statistics, effectiveness of blaze orange in reducing accidents and Westvaco's forestry and wildlife conservation practices. The sportsmen were also asked to sign an Operation RESPECT pledge card to demonstrate their support for improving hunter ethics.

Westvaco's paper mill at Covington distributed 1,500 vests to employees. At the company's three converting plants in Richmond, where various paper products are manufactured, another 1,400 vests were given to employees at Virginia Folding Box, Container Division, and Milk Carton Division. Several employees noted that even though they didn't hunt, the high visibility safety vest would be used while jogging and bike riding.

The cooperative program with Operation REPSECT to distribute 7,000 safety vests demonstates Westvaco's commitment to extend employee safety beyond the work place. With the increase in hunting accidents, this special program to promote the use of blaze orange by sportsmen will hopefully help reduce these tragic figures.

There has been much discussion among both hunters and non hunters regarding the merits of wearing blaze orange. Although this issue is complex, involving many factors, one fact is clear—*blaze orange saves lives.* As with any successful safety progam, it is up to each individual sportsman to use care and courtesy while in the woods to keep hunting a *safe* and *respectable* sport. □

by Dave Coffman, Westvaco Public Affairs Forester

Special Thanks

The Virginia Game Commission thanks all of the Virginians who cared about the nongame and endangered wildlife in 1985. For the first time in its four-year history, the Nongame Wildlife and Endangered Species Program received over half a million dollars in donations. Using line 20A on their state tax form, 57,007 Virginians donated just over $495,000. Others sent donations directly to the Commission throughout the year totaling $8348.41 The final figure at the end of the 1985 calendar year was $503,798.33.

At the end of November we were $5,000 short of our half-million dollar goal. To help up reach that goal before the end of 1985, contributions came in from all over the state. Our special thanks to those individuals who helped us achieve that goal by donating $5825 during the month of December. Without their generosity, we would not have met that goal.

The funds collected during 1985 will be used to help manage and research the needs of nongame and endangered wildlife, and implement public awareness programs. All contributions made during the 1985 calendar year, whether on the state tax form or directly to the Commission, are tax-deductible when returns are filed this year.

We are once again setting a goal of $500,000 for the 1986 calendar year. Persons receiving tax refunds can designate all or part of their refund for nongame and endangered wildlife on line 20A on state tax form 760, or on line 10A on form 760S. Others can contribute to the program by sending their contribution directly to the Commission. For more information, or to make a contribution, write: Virginia Game Commission, Nongame Program, P.O. Box 11104, Richmond, Virginia 23230-1104. □

Black Bear Conference Set

The Virginia Commission of Game and Inland Fisheries is co-sponsoring the Seventh International Conference on Bear Research and Management and the Eighth Eastern Black Bear Workshop this February in Williamsburg. These conferences will bring together biologists from all over the world who are conducting research on bears. The eastern conference will focus on the status, biology, and management of eastern black bear populations, and both conferences promise to increase our understanding of the species. □

Credit Due to Photographers

There were a couple of photos in the December 1985 issue of *Virginia Wildlife* that were not credited. On page 9, the beautiful picture of a ruffed grouse was taken by Nell Bolen. And, on page 18-19 the picture of the Canada goose was taken by Page Chichester. Our apologies to the photographers for this oversight. □

Hydrilla Facts Available

The Game Commission has free copies of "Hydrilla: A Water Weed Problem in the Potomac River," recently published by the State Water Control Board. The booklet explains the problems associated with this exotic aquatic plant which has spread to over 600 acres of the Potomac River between Alexandria and Quantico. The booklet also contains information on what to do if you come across the troublesome plant in recreational waters. For a free copy, write to: The Commission of Game and Inland Fisheries, Education Division, P.O. Box 11104, Richmond, VA 23230-1104. □

Virginia Big Game Winners

The 1984-85 Virginia Big Game Contest State Winners are:

Wild Turkey

Thomas A. Bondurant, 76 8/16, bagged May 4, 1985 in Appomattox County.

Charles Stevens, 75 12/16, bagged April 22, 1985 in Westmoreland County.

William C. Hogge, 75 7/16, bagged May 8, 1985 in York County.

Hugh B. Jackson, 73 11/16, bagged April 11, 1985 in Bedford County.

Orzal M. Johnson, 70 13/16, bagged May 11, 1985 in Culpeper County.

Black Bear

Elmer R. Steele, 29 3/8, bagged Nov. 27, 1984 in Bedford County.

Harold Keesee, 28 4/16, bagged Dec. 1, 1984 in Bedford County.

Mark Glaubke, 27 7/16, bagged Oct. 2, 1984 in the city of Suffolk.

Charles T. Bateman, 26 14/16, bagged Oct. 10, 1984 in the city of Chesapeake.

Robbie Cotrell, bagged Dec. 2, 1984 in Bedford County.

Whitetail Deer (Class 1)

Leonard Stoneburger, 23 points, 248 5/8; bagged Nov. 20, 1984 in Page County.

Edward Jones, 12 points, 221 15/16, bagged Dec. 22, 1984 in Surry County.

John Miller, 15 points, 216 1/8, bagged on Nov. 19, 1984 in Augusta County.

Allen Woodward, 13 points, 215 11/16, bagged on Nov. 26, 1984 in Loudoun County.

Danny Johnson, 16 points, 215 8/16, bagged on Nov. 27, 1984 in Greensville County.

Whitetail Deer (Class 2)

Lewis Bond, Jr., 8 points, 183 bagged Nov. 4, 1984 in Surry County.

Robert Montgomery, 8 points, 179 11/16, bagged on Nov. 23, 1984 in Bedford County.

Willie Boisseau, III, 8 points, 175 12/16, bagged on Jan. 5, 1985 in Nottoway County.

Terry Henderson, 8 points, 173 5/16, bagged on Dec. 14, 1984 in Albemarle County.

Edgar C. Barrett, Jr., 8 points, 172 10/16, bagged on Nov. 15, 1984 in Isle of Wight County.

Whitetail Deer (Class 3)

Keith Morris, 6 points, 142 2/16; bagged Jan. 1, 1985 in Orange County.

John N. Mills, 6 points, 141, bagged in Nov. 1984 in King William County.

James Fox, 6 points, 140 7/16, bagged on Jan. 4, 1985 in Spotsylvania County.

Shelton S. Staton, 6 points, 131 2/16 bagged on Nov. 19, 1984 in Albemarle County.

W.A. Wells, 6 points, 124 9/16, bagged on Dec. 22, 1984 in Sussex County.

Whitetail Deer (Archery)

Charles R. Davis; 10 points, 180 4/16; bagged in Prince William County.

Mark T. Smith, 11 points, 173 10/16, bagged on Oct. 25, 1984 in the city of Suffolk.

Ray Richmond, 8 points, 171, bagged on Oct. 23, 1984 in Surry County.

Edward Harrell, 170 15/16, bagged on Nov. 12, 1984 in Dinwiddie County.

Jarry Dinges, 10 points, 168 4/8, bagged on Nov. 8, 1984 in Page County.

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Bird of the Month

The House Finch

The house finch is a recent addition to Virginia's avifauna. A little over a decade ago, it was unknown in the state; now it is an abundant and familiar bird. Its story is one of phenomenal adaptability, of tolerance to the shock of change.

Until the early 1940's, the house finch was strictly a bird of the arid Southwest, ranging from Oklahoma and Texas to California. Common and widespread there, it was at home in congested cities as well as in wild canyonlands and desert scrub. Conspicuous about roadside dwellings and ranch houses, it occupied a niche similar to that of the English sparrow in the east and midwest.

Then, in 1940, cage-bird dealers shipped a large number of house finches, illegally caught in the wild, to New York. Since dealing in native birds is a violation of the Migratory Bird Treaty Act, federal agents stepped in. The birds were released on Long Island, and possibly elsewhere in the New York metropolitan area. From this small nucleus, the birds have colonized much of the Atlantic seaboard and are steadily spreading westward.

The first recorded nest in the east was at Babylon, Long Island in 1943. By 1971, they were well established in Connecticut, New Hampshire and Maine, and had reached Syracuse and Ithaca in New York. They had also become fairly common in Pennsylvania, Maryland and Virginia, and had begun to nest in the Carolinas.

At present, house finches seem to be residents of every Virginia county, with the possible exception of those in the extreme southwest. Though there is most likely no migratory movement, they seem most abundant during the winter months, when they flock to backyard feeders.

Highly social birds, house finches are quite gregarious, except during the nesting season, and travel about in groups, often of several dozen or more. In the West, they often gather in flocks of more than a thousand.

House finches exhibit their amazing adaptability at nesting time. They will build almost anywhere. Bird houses, mail boxes and light fixtures are likely to be appropriated, as are flower pots and watering cans. About man's dwellings, any cubby hole or crevice offered is suitable, be it the eaves of an outbuilding or the cornices of an ornate mansion. Bridges, windmills, piers—nothing which promises shelter is overlooked. One pair nested, apparently without dire consequence, at the base of a prairie falcon's nest. On the western deserts, cholla cactus with its protective spines, is a favored site.

They show the same catholic taste in their choice of nesting material. Again, just about anything will do: straw, grasses, weed stems, string, wool, bark, moss, hair and feathers. One pair used stands plucked from an old, decaying fish net.

Yet another reason for the extraordinary success of the house finch is its unceasing industry during the breeding period. At least two, and usually three broods are raised each season, with four or five youngsters in each batch.

The immature finches assume the adult plumage by their first autumn. The males begin to show the soft suffusion of rosy red about the head and chest and on the rump. The females retain the grayish-brown, sparrow-like streaking of the juveniles.

In all its plumages, the house finch is often confused with the purple finch, a close relative native to the east, but which comes to these latitudes only in winter. But their differences are readily noted. The red of the house finch is brighter than the wine or raspberry hue of its northern cousin. The females are a bit harder to distinguish, but the purple finch has a distinct eye stripe and ear patch, not present in the uniformly grayish brown head of the house finch.

Johannes Muller, a German ornithologist/explorer, first described the house finch in 1776. His specimens had been received from Mexico, so he gave it the specific name *mexicanus*, not knowing that the major portion of the birds' range lies to the north. The generic name *Carpodacus* derives from the Greek. *Carpos* means "fruit" and *dacos* means "biting."

The importation of the house finch into the east, though somewhat accidental, seems so far to have had happy results. The bird has a certain charm of manner, enhanced by a pleasant sprightly voice and an attractive appearance. It has none of the vulgar, raffish characteristics of the English sparrow, which it may well displace where the two species compete. □

by John W. Taylor